DETERMINING COST OF TURNOVER OF LABOR

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The following tentative proposals for a real cost system for labor turnover are offered for criticism. To date all estimates of the cost of hiring and firing have been mere guess work.

Mr. Magnus Alexander's thoughtful paper on "Personnel and Employment Problems," the only study of the subject, has been of use in making up this system, but one is forced to point out that his method of arriving at cost is more suggestive than authoritative, and was doubtless not intended to be final. He uses the opinions of experienced men, including his own, as a basis for arriving at each element of cost. This procedure might be repeated indefinitely without giving us anything reliable.

To follow the method here proposed will be expensive, but once there have been accumulated reliable statistics on the subject, the process of correction and follow-up will not be costly. Furthermore, the research can well be parcelled out among various plants to render immediate results of value. This, however, should not be mistaken for saying that the extent of each element of cost is the same in various plants. It is probably merely sufficiently the same that if several plants study each feature, the average results will yield an honestly average figure. Each individual plant must determine its own cost to get accurate results for its own guidance, and must expect the cost to vary somewhat from year to year.

Mr. Alexander estimated the cost of hiring a laborer at $8.50 and an unskilled machine operative at $73.50. Thus we see that if his figures are correct, a 100 per cent turnover of unskilled machine operative costs as much as an 860 per cent turnover of laborers. This difference in cost warrants our spending money and time to get reliable data. Furthermore, it reveals how inconclusive is the practice of stating turnover merely in percentages which lump together turnover of all grades of workers. A definite knowledge of cost will show us where we ought to place the greatest emphasis in efforts to reduce turnover, and will guide us accurately

in deciding how much to spend on apprentice instruction, welfare work and improved employment methods, and, especially give us knowledge of an employe's increasing usefulness to a concern as a basis for making wage increases for long service.

It should be noted, in connection with the accompanying outline, that no mention is made of the cost of rehiring former employes. This obviously differs from the cost of hiring new men. The cost, however, can be figured for each item precisely as with new employes. Former and new employes should simply be analyzed separately.

Determining Cost of Turnover

I. *What is meant by "turnover"*

1. The average standing pay roll for any given period should be given as basis
2. In case there is a general reduction in the number of positions during the period the percentage of new employes to the average standing pay roll should be taken
3. In case there is an increase in the organization the percentage of quitters to the average standing pay roll should be taken. In the first case the amount by which the number of quitters exceeds the number of new employes accounts for the reduction. In the second case the amount by which the new employes exceeds the quitters accounts for the increase.[1]

II. *Variables in the cost of turnover*

1. Cost varies by classes of skills of employes hired
   A. Highly skilled, all-round machinists or master workmen—
      a. Require little instruction
      b. Are easy on machines
      c. Are economical with supplies
      d. Soon reach normal output
      e. Scrap minimum of product
   B. Semi-skilled men—"operatives"—who have operated some one or two machines just long enough to make production on those machines—
      a. Require instruction on new jobs
      b. Are harder on machines
      c. Are careless with supplies
      d. Do not soon reach normal output
      e. Have high scrap average
   C. Unskilled operatives—
      a. Require still more instruction
      b. Are deadly on machines

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[1] *The Annals of the American Academy of Political and Social Science* on "Personnel and Employment Problems," article by R. A. Feiss, p. 51,

       c. Are wasteful of supplies
       d. May never reach normal output
       e. Scrap as much as they produce

    D. Laborers—
       a. Require little instruction and get less
       b. Don't use machines
       c. Can't waste many supplies
       d. Have short learning periods
       e. Scrap nothing

    E. Clerks—
       a. Require as much instruction as B
       b. Are about as hard on machines as B
       c. Use cheaper supplies
       d. Take as long as B to reach output but cost less per unit
       e. Use no product and hence waste none
       f. Have a high factor of expensive errors

2. Cost results will vary according to completeness of analysis. We should consider the following items:

    A. Cost of hiring, the only item which has a tendency to go up with the reduction of turnover because it is the only factor on a "production" basis

    B. Cost of instruction

    C. Cost of added wear and tear on equipment operated by green hands

    D. Cost of reduced production on machines operated by green hands, when payment is not strictly proportional to output

    E. Cost of excess plant necessary to make up production lost on machines operated by green hands

    F. Cost of scrap over and above the amount normal for experienced men

       We need not consider reduced sales due to delay in schedules or to spoiled work because they are too difficult to determine; neither should we count danger of strikes due to agitation among new employes, because too occasional. But these things exist and should be considered as showing our other cost estimates as probably conservative.

3. Cost results will vary according to length of time new employes are followed up

    A. Hiring *does not* vary in this way

    B. Instruction usually is limited to an arbitrary time—two or three days

    C. The new worker probably requires around three months to get familiar with machine in all respects, although this estimate remains to be proved

    D. Up to probably four weeks the new employe improves rapidly. It takes him probably six months to "hit his best stride." Not so, however, with laborers

    E. The excess plant requirement is proportional to reduced production

F. Excess scrap probably persists for a longer period than reduced production, because most men acquire speed more quickly than accuracy

G. Waste keeps pace largely with scrap

4. Cost varies according to the type and value of the equipment used by new employes, with respect to cost of:

A. Hiring—not so

B. Instruction—true to large extent

C. Wear and tear—to very large extent

D. Reduced production—holds true

E. Excess plant requirement—especially and chiefly

F. Scrap—to some extent

G. Waste—to some extent

Among the different classes of employes this variation is significant as follows:

Class A. This is important because they are likely to use expensive equipment

Class B. Important for same reason

Class C. Important

Class D. Does not hold true of laborers, who use little equipment

Class E. Holds true in less degree

III. *Figuring total costs while taking the above variables into account*

1. To figure cost of *hiring*—itemize:

A. Standard cost per employe for physical examination. Spread cost of total number *examined* over total number *hired*

B. Membership in employers' associations and other labor bureaus. Spread annual cost over number hired

C. Clerical help and all other salaries of employment department. Figure total number of men on "live" record during the year, whether employed or not—subtract the total for average standing pay roll. The ratio of remainder of names to the total on "live" record is proportion of cost of salaries which should be spread over the number of men hired

This subtraction of a proportion for employes on the pay roll is made in recognition of the fact that there would need to be clerical work of this sort even if there were no hiring done at all

D. Cost of advertising, trips out of town for men, office rent, new badges and miscellaneous, divided among number hired

E. Cost of printing prorated over number hired according to C

These items do not vary according to length of service or class of skills or types of equipment used.

2. Instruction—itemize:

A. Time of foremen spent with new employes

B. Time of workmen detailed as instructors for handling machine

C. Time of "time study" men acting as occasional instructors for handling work

Figure separately for an average month for each class of skill "A to E."

3. Wear and tear—itemize:
  A. Time of maintenance department on machines operated by new employes, minus a constant factor of time for experienced employes. (Obtain this factor by recording for a sufficient period the time of maintenance men spent on the average with a selected group of employes of all lengths of service over one year.)
  B. Cost of materials used for repairs on machines operated by new employes, minus a constant factor of material, for all employes. (Obtain as in "A.")
    (The above necessitates at least temporary use of job tickets for maintenance men, with space on tickets to indicate time spent with new and old employes.)
  C. Breakage and wear on tools, dies and jigs used by new employes, minus a constant factor for experienced employes
  D. Constant factor of cost per man for premature depreciation of machinery. This can only be guessed at, but it may be more closely approximated by a genuine research, which would:
    a. Take certain critical machines now worn out
    b. Find out best records of wear from the makers
    c. Compare average wear in given plant, and
    d. Spread the difference over the number of new men who worked on those machines during
    e. The actual life of those machines. Once determined by careful studies and compared with the results of other students, this could be made a constant factor for each plant, or each type of machinery, relative to complexity of design. Figure all but the last point for average month for all classes of skills save laborers.
4. Labor cost of reduced production. This cannot be figured exactly but can be approximately by averaging the results obtained by looking at the matter from several points of view. I suggest the following:
  A. First alternative—
    a. Determine by time study and standard practice the ideal capacity of each machine and production center in terms of production per hour
    b. In order not to charge up to turnover any loss of production due to defects in scheduling, record the actual man-hours worked on each production center for a given period and thus
    c. Arrive at total ideal output for that number of hours
    d. The difference between this and the actual output is the loss due to turnover and may be
    e. Prorated to the number of men hired for the period. Theoretically, workers have been paid for ideal output. Price this reduced production, therefore, at cost of departments in question of direct and indirect labor. All other items of cost are elsewhere provided for, under "waste," "excess plant," "wear and tear," etc. If a piece price is paid, however, new workers,

like old, being paid only for work actually done, only the cost of indirect labor should be assessed against the labor cost of reduced production. The above method is not strictly true, but if the ideal machine capacity is based upon the observed output of experienced operatives, it will be sufficiently correct.

B. Second alternative—
    a. Select a number of machines worked by new men and an equal number of like machines worked by men over a year in service
    b. Record the production of each group until the total of men reaches the total of old men
    c. Time required to teach this may be taken as average learning time
    d. Total difference of production during this time may be spread over the number observed and the average taken as the loss for the average man hired
    e. For men dropping out of the groups while under consideration substitute other men with approximately equal production and equal length of service. Separate observations should be taken for each class of skill—A, B, C, and E.

C. Laborers can be figured in about the same way, namely—
    a. Take a set quantity of trucking, etc.
    b. Compare the number of new as against the number of old men required to do this fixed quantity
    c. Drop men as they improve so as to keep output constant
    d. Until number in first gang equals number in old, this gives the learning time for laborers, and the loss of production of average new laborer.

5. Excess plant cost of reduced production
A. Assume that the plant investment required under present conditions will bear the same ratio to total investment in plant which would be needed if there were no turnover, as the production which would be possible with the present equipment operated by all experienced men would bear to the present actual output. In other words, if your reduced production is 20 per cent, your excess plant required is 20 per cent. This is stated as axiomatic

B. Find present total inventory

C. Figure on the basis of your present loss of production how much less equipment would be necessary without labor turnover

D. The difference may be used as basis for figuring the amounts of—
    a. Interest on capital
    b. Depreciation
    c. Power
    d. Insurance
    e. Rent
    f. Repairs
    which are due to turnover

E. Figure by shops, as if separate plants, for each class of skill using equipment and spread cost over turnover in those classes

Excess plant cost and labor cost of reduced production should be figured separately and then added together, instead of prorating excess plant cost as a burden on the labor cost of lost production, because the burden is not the same man for man, and department for department. Furthermore, in departments where wages are in proportion to efficiency, "excess plant" costs plus excess supervision constitute the sum lost by slow production.

6. Spoiled Work
   A. Select at random two equal groups of men representing evenly all grades of skill save laborers, one, a group of new employes, the other, of men over one year in service
   B. Compare total scrap losses for each group until approximately even per day period for some time. The point at which it began to be even may be taken as showing the average time required to reach normal scrap record
   C. Subtract total scrap made by old men from total made by new men and divide the difference by the number in a group, to get total scrap per new employe hired

7. Waste—
   Figure the same as scrap. The item includes waste of oil, cutting compound, compressed air, etc.